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New distributional record of *Cylindera* (*Oligoma*) *paradoxa* (W. Horn, 1892) (Coleoptera: Cicindelidae) in Ratnapura District, Sri Lanka

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Abstract. Since the 19th century, *Cylindera* (*Oligoma*) *paradoxa* (W. Horn, 1892) has been recorded from only 10 locations in Sri Lanka, with only 2 of those recorded in the past 30 years. We recently found this species in the Keeragala estate (Ratnapura District) during field surveys. Our new record fills a gap in the knowledge of this species' distribution in Sri Lanka.

Key words. Tiger beetles; range extension; Keeragala

Fifty-five species of tiger beetles belonging to 14 genera have been recorded from Sri Lanka, with 35 of them endemic to the country (Pearson & Cassola 2007, Acciavatti & Pearson 1989) and Sri Lanka is considered a hot spot for tiger beetle diversity (Santos 2014). Despite of this high diversity and endemism, recent studies are scarce and the distributions of the majority of species are poorly known. *Cylindera* (*Oligoma*) *paradoxa* (W. Horn, 1892) and *C.* (*O.*) *lacunosa* (Putzeys, 1875) are the only species of *Oligoma*, which has been reported from the Indian subcontinent (Acciavatti & Pearson 1989). Both species are recorded only from southern India and Sri Lanka. According to the literature (Horn 1904, Fowler 1912, Naviaux 1984, Acciavatti & Pearson 1989, Dangalle et al. 2012) and based on specimens housed at the Natural History Museum (NHMUK, London, England) and the Moscow State Pedagogical University Collection (MSPU, Moscow, Russia), *C. paradoxa* has been recorded in only 10 localities in Sri Lanka since the 19th century (up to 2015; Table 1). The NHMUK records were obtained by the second author during her visit to the collection and the MSPU records were communicated by Dr. A. Matalin (MSPU). The locality reports provided in the literature and collection records, except for Acciavatti & Pearson (1989) and Dangalle et al. (2012), do not specify the exact habitats or geographic coordinates. Here we present a new distributional record, which helps to fill the gap in the knowledge of the distribution of *C. paradoxa* in Sri Lanka.

As part of an ongoing study on the distribution of tiger beetles in Sri Lanka, field expeditions were conducted to Ratnapura District, Sabaragamuwa Province in 2015. Collections were made under permit WL/3/2/72/14 from the Department of Wildlife and Conservation.

Figure 1. Male of *Cylindera (Oligoma) paradoxa* before preserving (photo: Tharaka Wijerathne).

A specimen of *C. paradoxa* (Fig. 1) was collected at Keeragala estate, Keeragala, Ratnapura District (06°47.614′ N, 080°21.097′ E) on 11 April 2015 (Fig. 2) using a standard insect net. The sample was collected at sparse pasture adjacent to a slow flow stream (Fig. 3). Prior to capture, the collected individual was observed to be foraging at the place. The specimen was preserved in 70% ethanol for subsequent identification at the laboratory. This specimen, catalogued as CC-AT-0006 is deposited at the Museum of the University of Colombo. The specimen was measured as follows: total length without labrum, head width at the widest point between outer margins of the eye, pronotum length from anterior to posterior margin, pronotum and elytra width at widest point, elytra length from base of the scutellum to elytral apex.

We identified our specimen using the descriptions of Horn (1904) and the identification key of Acciavatti & Pearson

Figure 2. General view of the habitat from which the specimen was collected (photo: Tharaka Wijerathne).

(1989). Body measurements of our specimen and other available specimens (Dangalle at al. 2012; A. Matalin, personal communication) are listed in Table 2.

Among species of tiger beetles, *C. paradoxa* is classified as very small (Acciavatti & Pearson 1989, McCairns et al. 1997). The following characters confirm our specimen as *C. paradoxa*. The labrum has a prominent very pale median white spot and 6 submarginal setae. The head and pronotum is very dark shiny bronze and bears dark green lateral reflections. The pronotum is entirely glabrous. The elytra are dark brown or black with their entire surface densely punctate. Two oval spots are visible on each elytron, which has no stripes: 1 spot is located at the anterior ⅖ of the elytra; a second spot (apical) is placed more laterally at the apical angle of the elytra (Fig. 1).

The determination of the sex of our specimen was done

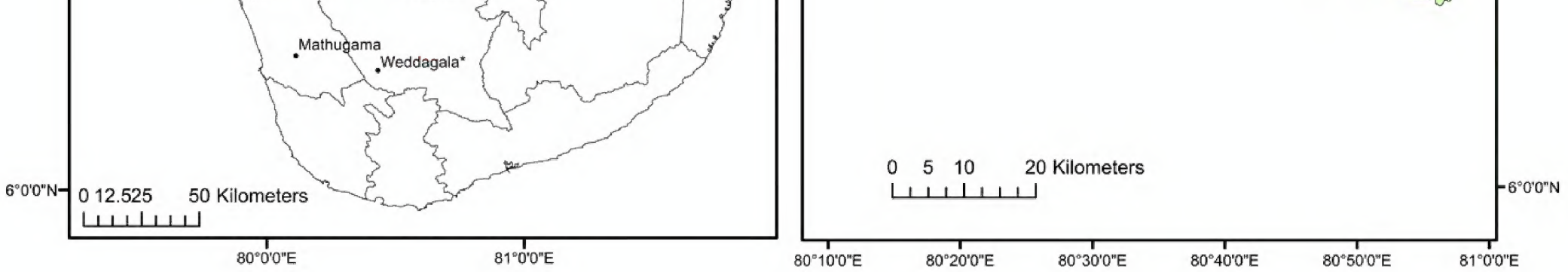

Figure 3. Map of Sri Lanka showing known distribution locations and new location (map created with ARCGIS using the WGS84 datum). Previous localities = black circle; new locality = red circle.

Table 1. Known localities of *Cylindera (Oligoma) paradoxa* (year collected in brackets, except for Horn (1904) and NHMUK records, for which these data were not available).

Horn 1904	Fowler 1912	Naviaux 1984	Acciavatti & Pearson 1989	NHMUK	MSPU	Dangalle et al. 2012	New record
Puttalam Negombo Matale Weligama	Ceylon	Kitulgala (1979, 1981) Weddagala (1983) Hendala (1979) Mathugama (1981)	Colombo Museum Garden (1976)	Colombo Weddagala Minneriya	Kitulgala (1997)	Colombo Museum Garden (2003)	Keeragala (2015)

Table 2. Body size measurements (in mm) of *Cicindela* (*Oligoma*) *paradoxa* specimens.

Parameters (mm)	Keeragala	Kitulgala (MSPU)			Garden of Colombo Museum (DANGALLE et al. 2012)	
	Male	Female	Female	Male	Specimen 1	Specimen 2
Total length	7.6	7.2	8.1	7.1	7.6	7.4
Head width	2.1	2.2	2.5	2.1		
Pronotum length	1.6	1.5	1.6	1.4		
Pronotum width	1.4	1.45	1.6	1.3		
Elytra length	4.6	4.4	4.8	4.1		
Elytra width	2.3	2.4	2.7	2.2		

by observing the pattern formed by setae on the tarsus of the forelegs under a dissecting microscope (Olympus SZ51, Japan). The presence of setal pads indicates that our specimen is a male (absence of these setal pads would indicate a female; PEARSON & VOGLER 2001).

Cylindera paradoxa has been reported from only 10 localities in Sri Lanka. Previous records do not record the precise locations (and habitats) and instead provide names of districts or cities only. Our new record is important as it is the only record from Ratnapura District after 32 years since original record done by NAVIAUX (1983) Surveys conducted during 2015 in Kitulgala and at the museum's garden in Colombo, previous localities for this species, did not result in finding *C. paradoxa*.

Due to the limited studies of the tiger beetle fauna of Sri Lanka, many aspects relating to their life cycle, population biology, and natural history are poorly known compared to elsewhere, and the conservation status of all species of Cicindelidae of Sri Lanka has not been assessed yet. Therefore, our record provides a valuable contribution to the study of tiger beetles in Sri Lanka.

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Author's contributions. AT and TW collected the specimens and conducted field work. AT wrote the text, made the maps, illustrations, identified the specimens and made measurements of the specimen. CD, NP, EL contributed towards formulating the initial concept, research design and methodology and writing of the paper.

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